

AMENDMENTS TO THE CLAIMS

A complete listing of all claims is presented below with insertions underlined (e.g., insertion), and deletions struckthrough or in double brackets (e.g., ~~deletion~~ or ~~[[deletion]]~~):

Claim 1. (Currently Amended) A distance measurement method using ultrasonic, comprising ~~the steps of~~:

transmitting, from a transmitter, an ultrasonic pulse having specific frequencies ~~to each object~~;

receiving, at a receiver, the ultrasonic pulse ~~that is reflected from the object or directly transmitted~~; and

amplifying the ultrasonic pulse and extracting a specific frequency of the ~~received~~ amplified ultrasonic ~~wave~~ pulse to find an arrival time of a first pulse and converting the arrival time into a distance.

Claim 2. (Currently Amended) The distance measurement method as claimed in claim 1, wherein ~~the step of finding the arrival time and~~ converting the arrival time into the distance further includes ~~the step of~~:

separating ~~[[a]] the~~ specific frequency of the ultrasonic pulse; and

converting ~~[[an]] the~~ arrival time of ~~[[a]] the~~ ultrasonic pulse that is received for the first time ~~among the separated ultrasonic~~ into the distance, in a state where the waveform received ultrasonic pulse is mixed with noise having different frequency properties from the specific frequency of the ~~transmitted~~ ultrasonic pulse.

Claim 3. (Currently Amended) The distance measurement method as claimed in claim 1, wherein ~~in the step of~~ converting the time into the distance, the extraction of the specific frequency from the received ultrasonic further comprises ~~the steps of~~:

amplifying the received ultrasonic pulse to generate an amplified signal;

filtering the amplified signal ~~weakening a signal of an unnecessary frequency among the amplified signal through an analog filter circuit~~ to generate a filtered signal in which an unnecessary frequency of the amplified signal is removed or weakened;

amplifying the filtered signal again to ~~generated~~ generate a re-amplified signal;
converting the re-amplified signal into a digital signal; and
extracting ~~[[a]]~~ the specific frequency from the converted digital signal through a digital signal processing.

Claim 4. (Canceled)

Claim 5. (Currently Amended) The distance measurement method as claimed in claim 1, wherein ~~in the step of receiving the ultrasonic pulse, reflected from the object while the object is moving comprises changing a received frequency depending on variation of the frequency of the transmitted ultrasonic~~ the receiver is a moving object.

Claim 6. (Currently Amended) A distance measurement method using ultrasonic, comprising ~~the steps of:~~

~~installing~~ setting a first receiver for receiving an ultrasonic pulse at a known position;

~~installing~~ setting a second receiver for receiving an ultrasonic pulse at an object to be measured;

~~transmitting an ultrasonic pulse having a specific frequency from a location where a distance from the object will be measured, to the first and second receivers;~~

amplifying the ultrasonic pulse and extracting specific frequencies of the ultrasonic pulse received ~~from at~~ the first receiver ~~and second receivers~~ to find an arrival time of ~~a first signal~~ the ultrasonic pulse received at the first receiver and converting the arrival time into a distance;

transmitting error information related to a difference between the distance obtained based on the ultrasonic pulse received by the first receiver and the known distance to the second receiver; and

allowing the second receiver to correct the velocity of sound using based on the error information.

Claim 7. (Currently Amended) A distance measurement device using ultrasonic pulse, comprising:

a transmitter ~~for generating~~ configured to generate and transmit an ultrasonic pulse having a specific frequency;

a sensor ~~for detecting~~ configured to receive the ultrasonic pulse ~~reflected from an object;~~

an amplifier ~~for amplifying~~ configured to amplify the ultrasonic pulse ~~detected by the~~ sensor;

an analog filter ~~for selectively attenuating~~ configured to selectively attenuate other frequencies except for ~~[[a]]~~ the specific frequency from the ultrasonic pulse amplified by the amplifier, to thereby generate an analog-filtered signal;

a secondary amplifier ~~for amplifying~~ configured to amplify an analog-filtered signal selected through the analog filter;

an A/D converter ~~for converting~~ configured to convert the amplified analog-filtered signal to a digital data;

a memory ~~for storing~~ configured to store the digital data therein; and

a digital signal processor ~~for processing~~ configured to process the digital data stored in the memory;

~~a numerical input unit for informing the digital signal processor of a processing condition; and~~

~~a communication unit for connecting the digital signal processor and an external apparatus to each other so that the digital signal processor and the external apparatus can exchange information;~~

wherein a transmission time of a first signal ~~transmitted from the transmitter among the received ultrasonic~~ is received and a delayed time of ~~the first signal is measured based on the transmission time and~~ an arrival time of the first signal calculated in the digital signal processor ~~are measured.~~

Claim 8. (New) The distance measurement device using ultrasonic as claimed in claim 7, further comprising:

an output unit configured to display results processed in the digital signal processor;

a numerical input unit configured to inform the digital signal processor of a processing condition; and

a communication unit configured to connect the digital signal processor and an external apparatus to each other so that the digital signal processor and the external apparatus exchange information.

Claim 9. (New) The distance measurement method as claimed in claim 1, wherein converting the arrival time into the distance includes:

separating the specific frequency of the ultrasonic pulse; and

converting the arrival time of the ultrasonic pulse that is received in a predetermined time into the distance, in a state where the received ultrasonic pulse is mixed with noise having different frequency properties from the specific frequency of the ultrasonic pulse.